PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference AMS.P52461WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/50927	International filing date *(day/month/year)* 02.12.2003	Priority date *(day/month/year)* 06.12.2002
International Patent Classification (IPC) or both national classification and IPC G01V1/38		
Applicant WESTERNGECO SEISMIC HOLDINGS LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
14.06.2004	07.03.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Schneiderbauer, K Telephone No. +49 89 2399-7613

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/50927

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-20 as originally filed

Claims, Numbers

1-42 as originally filed

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-4,14-18,23,24,38,39
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-42
Industrial applicability (IA)	Yes:	Claims	1-42
	No:	Claims	

2. Citations and explanations

see separate sheet

1.) Reference is made to the following document:

D1: US-A-5428581 (Doisy) 27-06-1995

2.) Technical field: seismic data processing

3.) Problems concerning clarity (Art.6 PCT):

3.1) The application does not comply with Art.6 PCT because the claims are not concise; they claim various subject-matters in the same category: claims 14 and 24 (methods) and claims 1 and 39 (apparatus, computer program).

3.2) The subject-matters of claims 1 (apparatus) and claim 14 (method) are too broadly defined and therefore not covered by the description (s. also PCT Guidelines Section IV / III-6.1): it is clear from the description (p.9, li.20 and p.12, li.5-7) that the invention relates to (method and apparatus):

- the determination of the position of sensors on a seismic cable based on a determined propagation time delay between source and sensors.

Also the processing unit (claim 1) is adapted to determine from a propagation time delay between source and sensors the position of the sensors on a seismic cable (p.12, li.5-7).

The wording of claims 1 and 14 embraces also the possibility of determining the position of a third object (different from the sensors on the cable) based on the calculated propagation time delay between source and receivers. This is not covered by the description.
It is therefore not clear in claims 1 and 14: a) to which purpose the determination of the propagation time delay serves and b) assuming that the purpose is the determination of a position, the position of which object is determined.

4.) The present application does not meet the requirements of **Article 33(1),(2) PCT**, because the subject-matters of claim 1 (apparatus) and the corresponding method claim 14 in there present form are not new. D1 describes a known method of determining the position of a moving target by (col.1, li.9-20):

- generating a positioning signal from a source
- receiving the positioning signal with a receiver positioned along a seismic cable
- providing a (computed) Doppler shifted positioning signal corresponding to the positioning signal (col.1, li.14-16)
- determining a propagation time delay from source to receiver using the generated positioning signal, the received positioning signal and the computed Doppler shifted positioning signal (col.1, li.13-20; the correlation step between received signals and several copies of Doppler shifted signals).

5.) A method (apparatus) for determining the position of sensors on a seismic cable claimed as independent claims 1 and 14 without the deficiencies as mentioned in point 3 ("problems concerning clarity") does not appear to be inventive over D1 (**Art. 33(1),(3) PCT**). It merely employs the same principle (using computed Doppler shifted positioning signals) for the localization of the sensors and not of a third object.

6.) Independent claims 24 and 39:

The subject matters of these claims are not new (**Art.33 (1),(2), PCT**): they constitute the set-up of look-up tables which are used by the signal processing unit and which implicitly must exist in the known method as described in D1 (col.1, li.14-16: "... copies of the signals sent out, each copy corresponding to a different Doppler shift.").

7.) The dependent claims:

7.1) The subject-matters of dependent claims 2,3,4,15-18,23 and 38 are comprised in D1 (col.1, li.9-20 or implicitly comprised like the library and the Doppler shifted signals stored in the library) and therefore not new (**Art. 33(1),(2) PCT**).

7.2) The subject-matters of claims 5-13, 19-22, 25-37 and 40-42 appear to be a matter of normal design procedure which easily would be included in D1 and which therefore do not involve an inventive step (**Art.33(1),(3) PCT**).

8.) Industrial applicability (Art.33(1),(4) PCT):

Beyond any doubt the invention, as defined in claims 1-42, is industrially applicable.